E.O. Lawrence Berkeley National Laboratory
University of California
Environmental Restoration Program

United States Department of Energy

REQUEST FOR
NO FURTHER ACTION (NFA) STATUS
FOR
Sanitary Sewer Lines North and West of Buildings 51 and 51B
(Area of Concern 9-8)
and
Building 25A Sanitary Sewer
(Area of Concern 10-3)

for the

Lawrence Berkeley National Laboratory

ENVIRONMENTAL RESTORATION PROGRAM

January 2000

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A Joint Effort of
Environment, Health and Safety Division and
Earth Sciences Division
Lawrence Berkeley National Laboratory
University of California
Berkeley, CA 94720

January 2000

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CONTENTS

LIST OF ABBREVIATIONS

AOC	Area of Concern
Berkeley Lab	Lawrence Berkeley National Laboratory
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
CAL-EPA	California Environmental Protection Agency
CAP	Corrective Action program
COPCs	chemicals of potential concern
DCA	dichloroethane
DCE	dichloroethene
DTSC	Cal-EPA Department of Toxic Substances Control
EPA	U. S. Environmental Protection Agency
ERP	Environmental Restoration Program
FY	Fiscal Year (October 1 to September 30)
MCL	Maximum Contaminant Level
mg/kg	milligrams per kilogram
µg/L	micrograms per liter (10^{-6} grams per liter)
NFA	No Further Action
NFI	No Further Investigation
PCB	polychlorinated biphenyl
PCE	tetrachloroethene (perchloroethene)
PRG	Preliminary Remediation Goal
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RWQCB	Regional Water Quality Control Board
SWMU	Solid Waste Management Unit
TCA	trichloroethane
TCE	trichloroethene
THC	total hydrocarbons
TPH-D	Total Petroleum Hydrocarbons-diesel
TPH-G	Total Petroleum Hydrocarbons-gasoline
VOCs	volatile organic compounds

SECTION 1

PURPOSE AND SCOPE

The purpose of this report is to request approval of No Further Action (NFA) status for the Sanitary Sewer Lines North and West of Buildings 51 and 51B (Area of Concern [AOC] 9-8) and the Building 25A Sanitary Sewer (AOC 10-3), under the Resource Conservation and Recovery Act (RCRA) Corrective Action Program (CAP) at Lawrence Berkeley National Laboratory (Berkeley Lab). The California Environmental Protection Agency (CAL/EPA) Department of Toxic Substances Control (DTSC) is the lead regulatory agency for the CAP and has the authority to approve NFA status for this unit. If NFA status is approved, no additional soil sampling would be required and the unit will not be included in the site-wide risk assessment. Groundwater monitoring will continue as required by the Regional Water Quality Control Board (RWQCB). The locations of AOC 9-8 and AOC 10-3 are shown on Figure 1.

Berkeley Lab initially included AOC 9-8 and AOC 10-3 in a report that was submitted to DTSC in January 1999, requesting NFA or No Further Investigation (NFI) status for two Solid Waste Management Units (SWMUs) and four AOCs at Berkeley Lab (Berkeley Lab, 1999). In April 1999, DTSC responded with a Notice of Deficiency to Berkeley Lab's NFA/NFI request (DTSC, 1999). Berkeley Lab submitted comments to DTSC's Notice of Deficiency on May 28, 1999. Berkeley Lab's responses to specific DTSC's comments on AOC 9-8 and AOC 10-3 are attached (Attachment 1).

SECTION 2

DESCRIPTIONS OF UNITS

2.1 SANITARY SEWERS NORTH AND WEST OF BUILDINGS 51 AND 51B (AOC 9-8)

2.1.1 Site Description and History

The Sanitary Sewer Lines North and West of Buildings 51 (the Bevatron) and 51B (AOC 9-8) carried effluent from the Buildings 51 Motor Generator Room Discharge Sump (AOC 9-9). Potential sources of influent to the discharge sump were some Building 51 operations including: the Vacuum Pump Room Sump and Collection Basin (SWMU 9-4) and the Motor Generator Room Sump (SWMU 9-6). Other sources of influent to the sanitary sewers are Building 64, Building 51B, and Building 71 sanitary sewers. The locations of the sewer lines are shown on Figure 2. Soil and groundwater sampling locations are included on the figure.

2.1.2 Constituents Of Potential Concern (COPCs)

The COPCs are halogenated hydrocarbons, mercury, polychlorinated biphenyls (PCBs), and fuel related hydrocarbons.

2.1.3 Geology and Hydrogeology

Geologic cross sections along the sanitary sewer lines (C-C' and D-D') are shown on Figure 3 and Figure 4. The locations of the cross sections are shown on Figure 2. The uppermost bedrock unit consists primarily of Great Valley Group shale. At the easternmost end of cross section CC' (north of Building 51), the bedrock consists of siltstone of the Orinda Formation overlying the Great Valley Group. Where the bedrock does not extend to the surface, it is covered by artificial fill and colluvium. The fill includes clay, silt, and silty sand.

The depth to groundwater measured in monitoring wells during the third quarter (April to June) of fiscal year 1999 (FY99) and the interpreted water table is shown on the cross sections.

Based on results of slug tests conducted in monitoring wells, the Great Valley Group at Berkeley Lab has a hydraulic conductivity of 10^{-5} to 10^{-7}m/s and the Orinda Formation 10^{-7} to 10^{-9}m/s. Results of slug tests conducted in monitoring wells near the sewer lines are shown in the following table. Based on the results, the fill near the sewer lines has a hydraulic conductivity of 10^{-6} to 10^{-8}m/s.

Results of Slug Tests

Well Number	Hydraulic Conductivity (m/sec)
Surficial Deposits (primarily Fill)	
MW51-97-3	1.9×10^{-6}
MW51-97-14	3.5×10^{-7}
MW51-97-12	7.1×10^{-7}
MW51-96-19	7.8×10^{-7}
MW51-96-16	4.5×10^{-8}
Surficial Deposits/Orinda Formation	
MW51-96-15	2.8×10^{-6}
Orinda Formation	
MW51-96-17	1.0×10^{-8}

2.2 BUILDING 25A SANITARY SEWER (AOC 10-3)

2.2.1 Site Description and History

Two sanitary sewer lines emanate from the east side of Building 25A, merge with another line emanating from the east side of Building 26, and continue beneath the road north and east of Buildings 25A and 26. The location of the Building 25A Sanitary Sewer (AOC 10-3) is shown on Figure 5. Soil, soil gas, and groundwater sampling locations are included on the figure.

Building 25A contains mechanical technology and electronics shops, respectively. Operations in Building 25A include plastics soldering and electronics fabrication. Cleaning solvents have been used in Building 25A, and there are solvent fume hoods, sinks, floor drains, and a subfloor waste line that flows out of the east side of the building to the sanitary sewer system.

2.2.2 Constituents Of Potential Concern (COPCs)

The COPCs are halogenated hydrocarbons and metals.

2.2.3 Geology and Hydrogeology

Geologic cross sections along the sanitary sewer line are shown on Figure 6 and Figure 7. The locations of the cross sections are shown on Figure 5. The bedrock units beneath the sanitary sewer line consist of tuff, tuff breccia, and andesite of the Moraga Formation; clayey gravel of the Mixed Unit; and claystone, siltstone, and sandstone of the Orinda Formation. Colluvium and artificial fill (silt and sand) overlie the bedrock along the eastern half of the sanitary sewer line.

The depth to groundwater measured in monitoring wells during the third quarter of FY99 and the interpreted water table are shown on the cross sections. Based on results of slug tests conducted in monitoring wells, the Moraga Formation at Berkeley Lab has a hydraulic conductivity of 10^{-4} to 10^{-6}m/s, the Mixed Unit 10^{-6} to 10^{-9}m/s, and the Orinda Formation 10^{-7} to 10^{-9}m/s. Results of slug tests conducted in monitoring wells near the sewer line are shown in the following table. The tested wells were all screened in the Orinda Formation.

Results of Slug Tests

Well Number	Hydraulic Conductivity (m/sec)
Orinda Formation	
MW25A-98-1	2×10^{-7}
MW25A-98-7	2×10^{-7}
MW26-92-11	2×10^{-5}

SECTION 3

SEWER LINE INVESTIGATIONS

3.1 INTRODUCTION

The following approach was followed to investigate whether a release may have occurred from the Sanitary Sewers North and West of Buildings 51 and 51B (AOC 9-8) and the Building 25A Sanitary Sewer (AOC 10-3). The approach is consistent with Berkeley Lab's response to DTSC's comments (Attachment 1) and discussions held with the DTSC and the City of Berkeley at Berkeley Lab on July 1, 1999.

1. Assess the integrity of the line by conducting a video survey to identify any dislocations, breaks or perforations.

2. If dislocations, breaks, or perforations are identified, collect soil samples to determine whether a release has occurred and to assess the extent of contamination. If no dislocations, breaks, or perforations are identified, request the unit for NFA status.

3.2 RESULTS OF VIDEO SURVEYS

On October 14, 1999, Berkeley Lab conducted a video survey of the sanitary sewer lines east of Building 25A (AOC 10-3). On October 26, 1999, Berkeley Lab conducted a video survey of the sanitary sewer lines north and west of Buildings 51 and 51B (AOC 9-8). The segments of the sewer lines that were video surveyed are shown on Figure 2 and Figure 5 for AOC 9-8 and AOC 10-3, respectively. No defects, root intrusion, or displacement was observed within any of the lines surveyed. The details and results of the surveys are included in the attached memorandums (Attachment 2). Based on the results of the video surveys there is no indication that a chemical release has occurred from the sewer lines.

SECTION 4

SUPPLEMENTAL ENVIRONMENTAL INVESTIGATIONS

4.1 SANITARY SEWERS NORTH AND WEST OF BUILDING 51 AND BUILDING 51B (AOC 9-8)

4.1.1 Summary of Investigations

Soil and groundwater sampling locations related to the Sanitary Sewers North and West of Buildings 51 and 51B are shown on Figure 2.

Soil Gas

Soil-gas samples were collected in the Building 51 area during the RCRA Facility Assessment (RFA), including seven locations along the sanitary sewer lines north and west of Buildings 51 and 51B. The samples were collected from probes inserted to depths between 5 and 11 feet below ground surface (bgs), in order to sample below the invert elevation of the sewer line. The samples were analyzed for volatile organic compounds (VOCs).

Groundwater

A plume of halogenated hydrocarbon-contaminated groundwater (Building 51/64 VOC Plume [AOC 9-13]) is present in the area between Buildings 51 and 64. Groundwater monitoring wells have been installed to help characterize the magnitude and extent of the groundwater contamination. Several of these wells installed in 1996 and 1997 were located near the sanitary sewer lines, including MW51-96-16, MW51-96-17, MW51-97-3, MW51-97-4, MW51-97-12, and MW51-97-14. MW51-97-3, MW51-97-4, MW51-97-12, and MW51-97-14 are also located near manholes in the sanitary sewer line west of Building 51B. Plume characterization and groundwater monitoring are discussed in the Berkeley Lab Quarterly Progress Reports.

Soil Samples

Soil samples (SS51N-02, SS51N-03, SS51W-03, and SS51W-07) were collected along the sewer lines during the RFA to assess whether PCBs from the Building 51 Motor Generator Room and Vacuum Pump Room Sumps and Collection Basins (SWMUs 9-4 and 9-6) could have leached to soil from the sanitary sewers outside Building 51.

Soil samples were also collected from the borings of the monitoring wells installed in 1996 and 1997 and analyzed for VOCs and metals.

4.1.2 Results

Soil

Analytical results are included in Table 1a (organics) and Table 1b (metals). No PCBs were detected in the soil samples collected during the RFA. Low concentrations (0.01 mg/kg maximum) of halogenated hydrocarbons (tetrachloroethene (PCE), trichloroethene (TCE), 1,1-dichloroethene (DCE), and cis-1,2-DCE) and aromatic hydrocarbons (toluene) were detected in soil samples collected along the sanitary sewer lines. These detections were below the water table in areas of known groundwater contamination. Concentrations of VOCs detected are shown on the cross sections (Figure 8 and Figure 9). All VOCs were detected at concentrations below the United States Environmental Protection Agency (EPA) Region 9 Preliminary Remediation Goal (PRG) for residential soil (EPA, 1999).

Barium, chromium, cobalt, nickel, vanadium, and zinc were detected at concentrations above Berkeley Lab background levels (Berkeley lab, 1995). Nickel was the only metal detected at a concentration above the PRG for residential soil (243 mg/kg and 194 mg/kg). Both of these detections were in samples collected well below the invert elevation of the sanitary sewer line, with the shallower samples from the borings having much lower concentrations.

Groundwater

The Building 51/64 VOC Plume underlies the portion of the sanitary sewer north of Building 51. The groundwater contamination is defined by the presence of several halogenated

hydrocarbons, predominantly 1,1-dichloroethane (DCA), PCE, TCE, cis-1,2-DCE, 1,1-DCE, and vinyl chloride. Several halogenated hydrocarbons have been detected at concentrations above their Maximum Contaminant Levels (MCLs) for drinking water. The extent of the groundwater contamination has been defined, and the source of the contamination has been identified adjacent to the southeast corner of Building 64. The sewer lines are not located in the source area of the plume and are therefore not the source.

4.2 BUILDING 25A SANITARY SEWER (AOC 10-3)

4.2.1 Summary of Investigations

Soil, groundwater, and soil-gas sampling locations related to the Building 25A Sanitary Sewer are shown on Figure 5.

Soil Gas

Soil-gas samples were collected during the RFA at 25 locations along the sanitary sewers emanating from Buildings 25A and 26. The samples were taken from approximately one foot beneath the sanitary sewer line invert elevation and as close as practicable to the line. All samples were analyzed for VOCs, and some samples were also analyzed for total hydrocarbons (THC), total petroleum hydrocarbons as gasoline (TPH-G), and cumene.

To help locate the source of the TCE contamination detected in groundwater west of Building 25A (designated as AOC 10-5), soil-gas probes were installed at 24 locations inside and on the north and west sides of Building 25A in 1998. Eight of the probes were located near the sanitary sewer line or floor drains under the building.

Groundwater

In 1992, groundwater monitoring well MW26-92-11 was installed adjacent to the sanitary sewer line, at a location where the maximum concentration of PCE was detected in soil gas.

In August 1993, groundwater monitoring well MW76-93-7 was installed south of Building 76L to characterize the extent of groundwater contamination (not associated with the

building 25A sewer line) detected in MW76-1. MW76-93-7 was located near a manhole in the Building 25A sewer line.

In 1998 and 1999, groundwater monitoring wells were installed to help locate the source of the TCE contamination detected in groundwater near the western end of Building 25A. Three of these wells (MW25A-98-6, MW25A-98-7, and MW25A-99-2) are also located adjacent to the sanitary sewer line under the building.

Soil Samples

Soil samples were collected from the boring for MW26-92-11 and analyzed for VOCs and benzene, toluene, ethylbenzene, and xylenes (BTEX).

Soil samples collected from the boring for MW76-93-7 and analyzed for VOCs, total petroleum hydrocarbons as diesel (TPH-D), TPH-G, oil & grease, and metals.

In April 1995, soil borings SB25-95-2 and SB25-95-3 were drilled next to the sewer lines emanating from the east side of Building 25A. Soil samples were collected from SB25-95-2 at approximately 4 feet bgs, and samples from SB25-95-3 were collected between 5 and 36 feet bgs. Samples were analyzed for VOCs, fuels, pH, and metals.

Shallow soil samples were collected at eight locations in 1998 (SS25A-98-1 through SS25A-98-8) at floor drains and along the sub-floor waste line system of Building 25A that drain to the sanitary sewer system east of Building 25A. The purpose of the sampling was to evaluate if a release from the floor drains or drain lines under the building was the source of the TCE detected in the groundwater. Soil samples were collected at depths of approximately 2 and 4 feet below the surface at seven of the locations and at 2 feet below the floor surface at one location (SS25A-98-7) and analyzed for VOCs.

Soil samples were collected from the borings for MW25A-98-6, MW25-98-7, and MW25A-99-2 and analyzed for VOCs. In addition, selected composite samples were analyzed for metals.

4.2.2 Results

Soil-Gas

TCE was detected in soil-gas samples from all eight probes installed beneath the floor of Building 25A, and Freon-113 was detected in seven of the probes. The TCE concentrations ranged from 33 ppbv to 7,000 ppbv. The Freon-113 concentrations ranged from 4.8 ppbv to 810 ppbv. The distribution of TCE concentration in the soil gas is in general agreement with the TCE concentration distribution in the groundwater.

Soil

Analytical results are included in Table 2a (organics) and Table 2b (metals). Concentrations of VOCs detected are shown on the cross sections (Figure 10 and Figure 11). Trace concentrations of TCE (0.013 mg/kg) and 1,1,1-trichloroethane (TCA) (0.015 mg/k) were the only VOCs detected in soil samples. Both of these detections were below the water table under Building 25A, in an area of known groundwater contamination. In addition, VOCs were not detected in the samples collected at floor drains and along the sub-floor waste line system beneath Building 25A, indicating the sewer line under the building was not the source of the soil or groundwater contamination. Petroleum hydrocarbons were not detected in the samples for which it was analyzed.

Cadmium, chromium, cobalt, lead, nickel, and silver were detected at concentrations above Berkeley Lab background levels (Berkeley Lab, 1995). Nickel was the only metal also detected above the PRG for residential soil in two samples (190 mg/kg in MW26-92-11 and 165 mg/kg in the composite sample from MW25A-98-7). Both samples from MW26-92-11 that contained nickel above Berkeley Lab background levels were collected in the Orinda Formation. MW25A-98-7 was also sampled in the Orinda Formation. The Orinda Formation has a higher nickel background level (144 mg/kg) than the other geologic formations at Berkeley Lab (Berkeley lab, 1995). The sample collected immediately below the invert elevation of the sewer line at MW26-92-11 contained only 40 mg/kg of nickel.

Levels of pH measured in SB25-95-2 and SB25-95-3 were neutral to slightly basic ranging from 7.6 to 9.0.

Groundwater

Two areas of groundwater contamination are present in the vicinity of the Building 25A sanitary sewer line: 1) PCE in groundwater east of Building 25A and 2) TCE in groundwater beneath and to the west of Building 25A.

PCE (7.0 to 25 μg/L) has been consistently detected in groundwater samples collected from MW26-92-11 in quarterly sampling since October 1992. Traces (generally 1 μg/L or less) of TCE, 1,1,1-TCA, 1,1-DCE, 1,2-DCA, and chloroform have also been detected. Concentrations of PCE detected in MW26-92-11 have shown a decreasing trend. A grab groundwater sample was collected from SB25-95-3 in 1995. PCE (41 μg/L) and traces of 1,1-DCE and TCE were detected. The source of this groundwater contamination is not known.

TCE has been detected in groundwater at concentrations above 100 μg/L in monitoring wells MW25A-98-7 and MW25-99-2 near the western end of Building 25A. The source of the groundwater contamination is not known. Based on results of soil sampling along the sewer line and floor drains under the building, the sewer line is not the source of the contamination.

SECTION 5

RATIONALE FOR NFA RECOMMENDATION

NFA status is recommended for the Sanitary Sewer Lines North and West of Buildings 51 and 51B (AOC 9-8) and the Building 25A Sanitary Sewer (AOC 10-3). Berkeley Lab followed the methodology specified in Berkeley Lab's response to DTSC's comments (Attachment 1) and discussions held with the DTSC and the City of Berkeley at Berkeley Lab on July 1, 1999 to investigate whether a release had occurred from the sewer lines, as follows:

1. Conduct a video survey of sewer lines to identify dislocations, breaks or perforations.
2. If dislocations, breaks, or perforations are identified by the survey, conduct additional sampling.

Based on the results of the video survey and the associated soil sampling, there is no indication that a chemical release has occurred from the sewer line. No defects, root intrusion, or displacement was observed within any of the lines surveyed (Attachment 2).

Supplemental information to support the NFA request includes the following:

- Only trace concentrations (<0.02 mg/kg) of VOCs were detected in any of the soil samples collected along the sewer lines. The locations where the VOCs were detected were below the water table in areas of known groundwater contamination. No VOCs were detected in the soil samples collected below the invert elevation of the sewer lines and above the water table.

- Nickel was the only metal detected at a concentration above both the Berkeley Lab site wide background level and PRG for residential soil. The highest nickel concentrations were detected in the lower sections of the borings, generally within the Orinda Formation. The Orinda Formation has a higher background level for nickel than the other geologic formations at Berkeley Lab. Shallow samples collected from the same borings at depths below the sewer lines contained much lower concentrations of nickel (well below the background level and PRG).

- The source of the groundwater contamination detected in the area of the sanitary sewers north and west of Buildings 51 and 51B has been identified and it is not associated with the sewers. The source area of the groundwater contamination in the area of the Building 25A sanitary sewer has been identified near the west end of Building 25A and it is not associated with the sewer. Groundwater monitoring will continue in both the Building 25A and 51 areas as required by the RWQCB.

SECTION 6

REFERENCES

DTSC, 1999. *Notice of Deficiency* for NFA or NFI Status Request for SWMUs 3-6 and 9-6 and AOCs 8-7, 9-8, 10-3, Lawrence Berkeley National Laboratory, Berkeley, CA, EPA ID no. CA4890 008 986, April 30, 1999.

Berkeley Lab, 1995. *Protocol for Determining Background Concentrations of Metals in Soil at Lawrence Berkeley National Laboratory (Berkeley Lab).* Environmental Restoration Program, Lawrence Berkeley National Laboratory. August 1995.

Berkeley Lab, 1999. *Request for No Further Action (NFA) or No Further Investigation (NFI) Status for Selected Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs).* Lawrence Berkeley National Laboratory Environmental Restoration Program. January 1999.

EPA, 1999. *Region 9 Preliminary Remediation Goals (PRGs) 1998.* USEPA Region IX.

LIST OF FIGURES

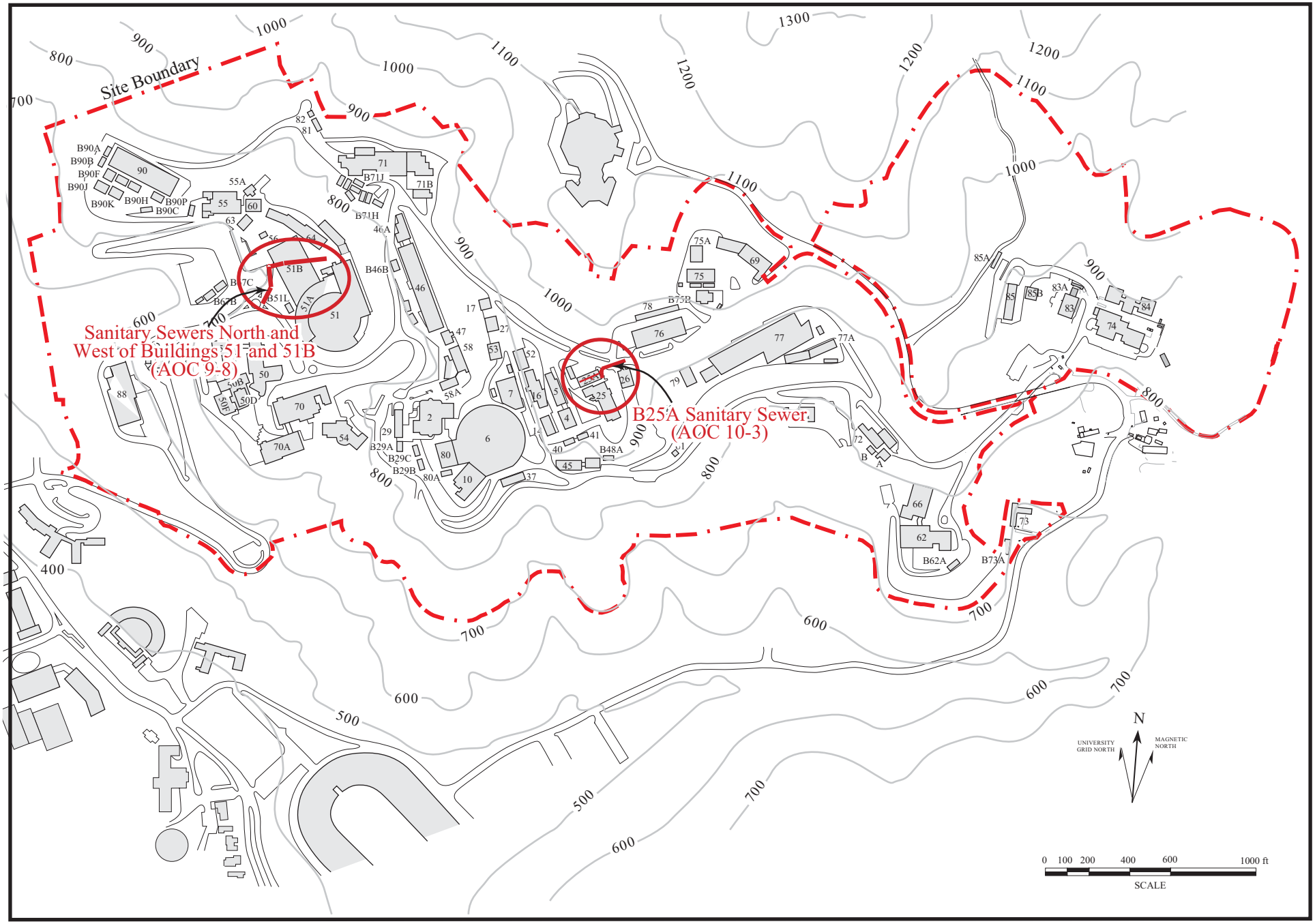

Figure 1. Locations of Sanitary Sewers North and West of Buildings 51 and 51B (AOC 9-8) and Building 25A Sanitary Sewer (AOC 10-3)

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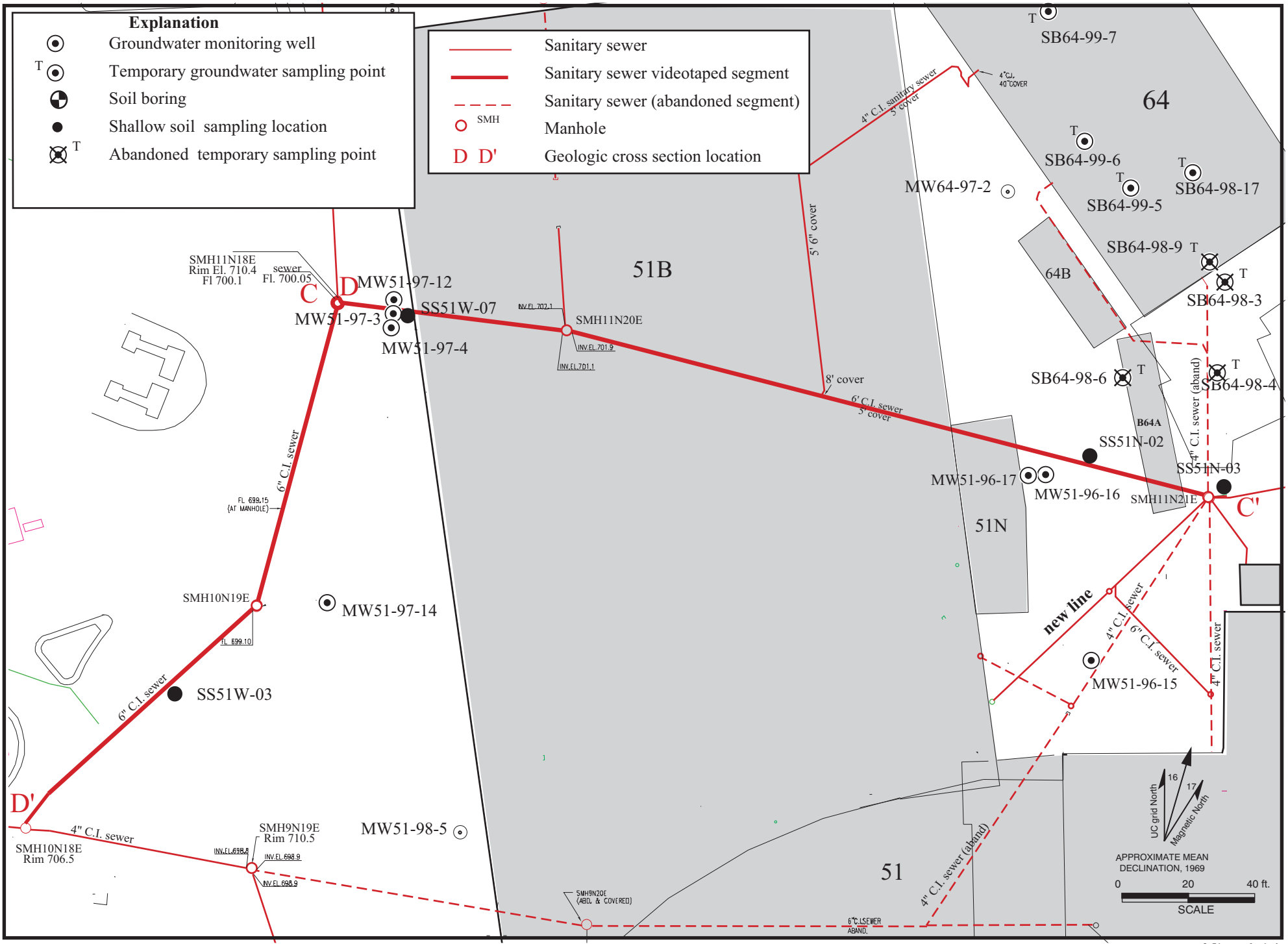

Figure 2. Location of Sanitary Sewers North and West of Buildings 51 and 51B (AOC 9-8).

2-51 sewerloc1.ai
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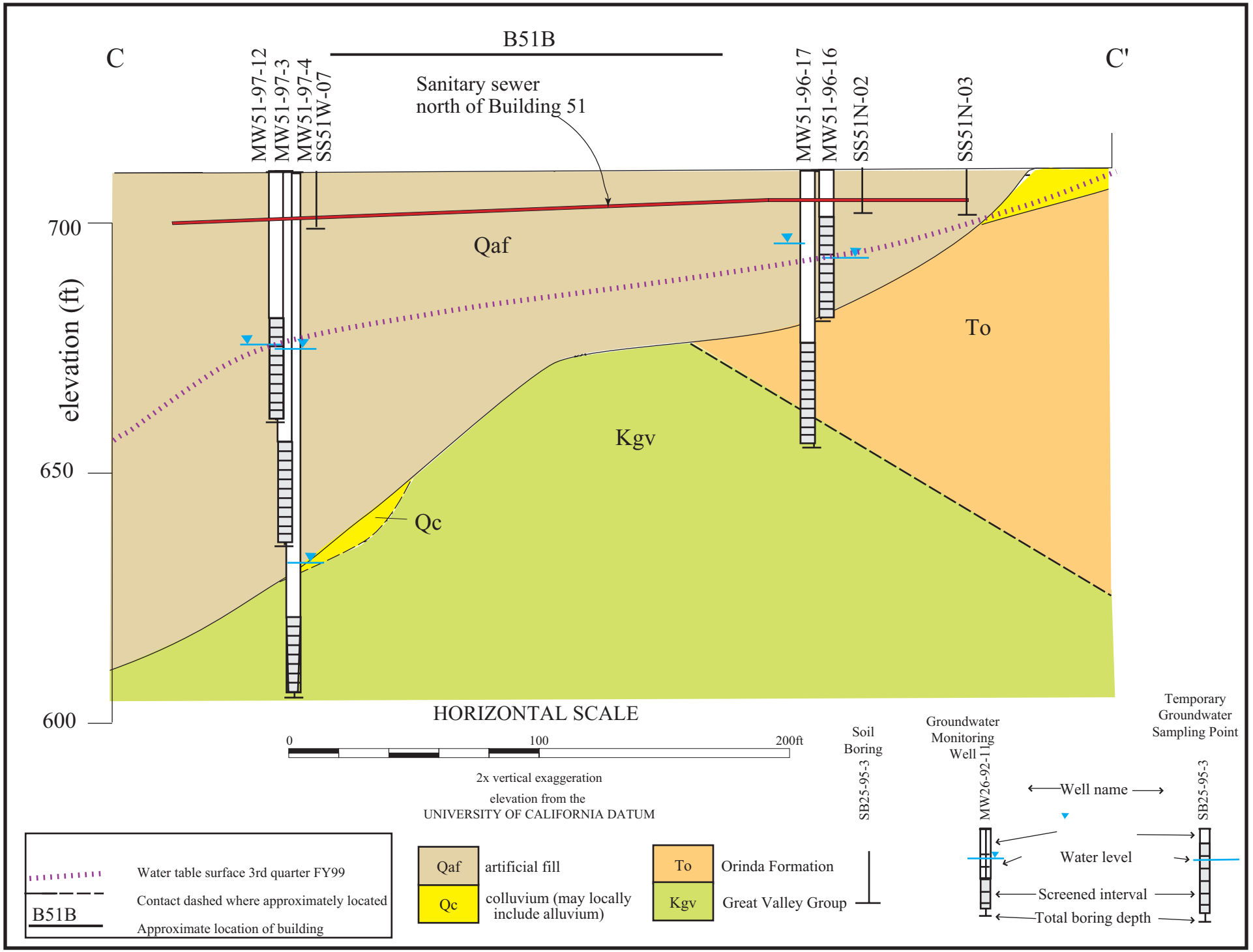

Figure 3. Geologic Cross Section C C', Sanitary Sewers North and West of Buildings 51 and 51B

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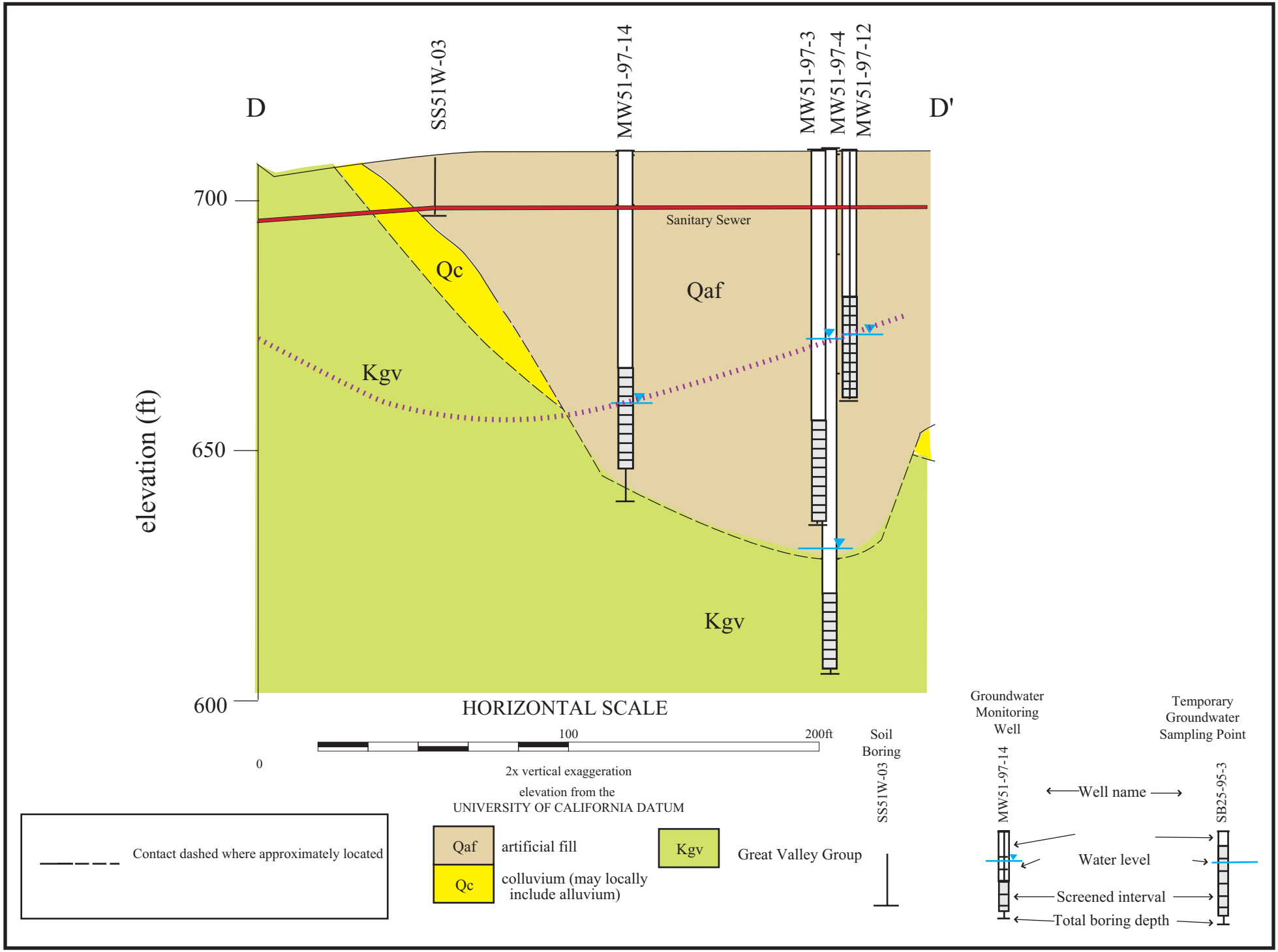

Figure 4. Geologic Cross Section D D', Sanitary Sewers North and West of Buildings 51 and 51B

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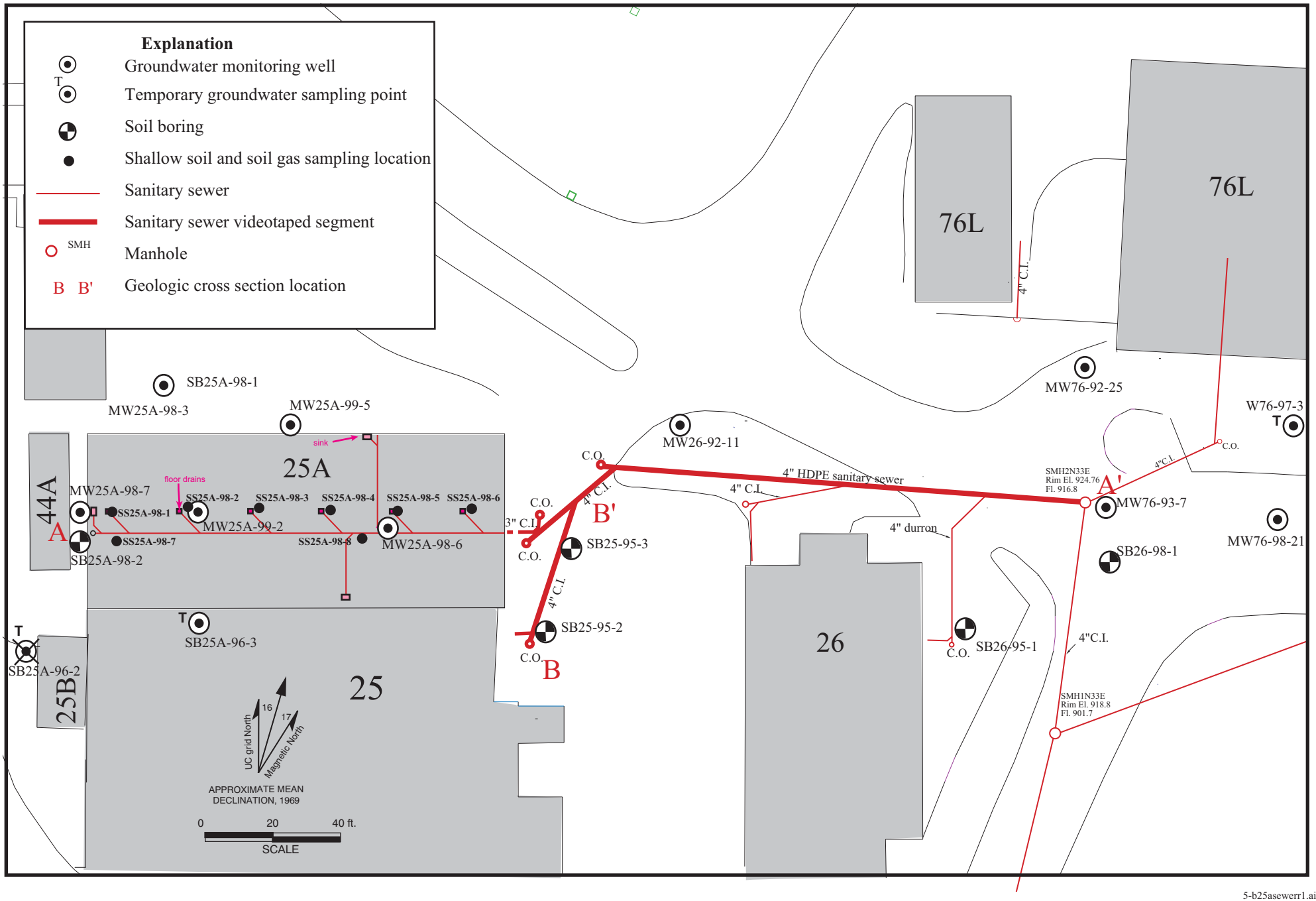

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Figure 5. Location of Building 25A Sanitary Sewer (AOC 10-3).

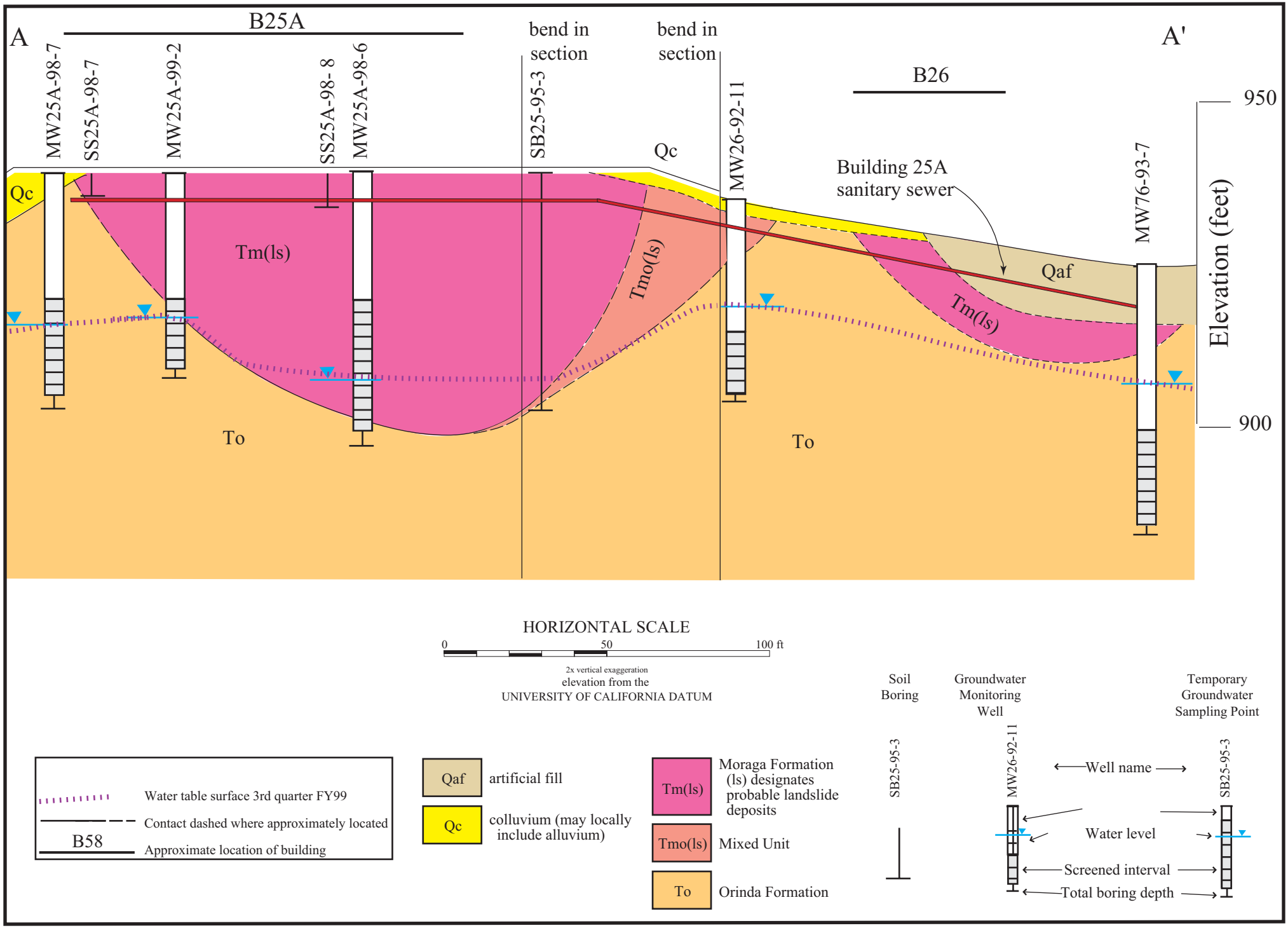

Figure 6. Geologic Cross Section A A', Building 25A Sanitary Sewer

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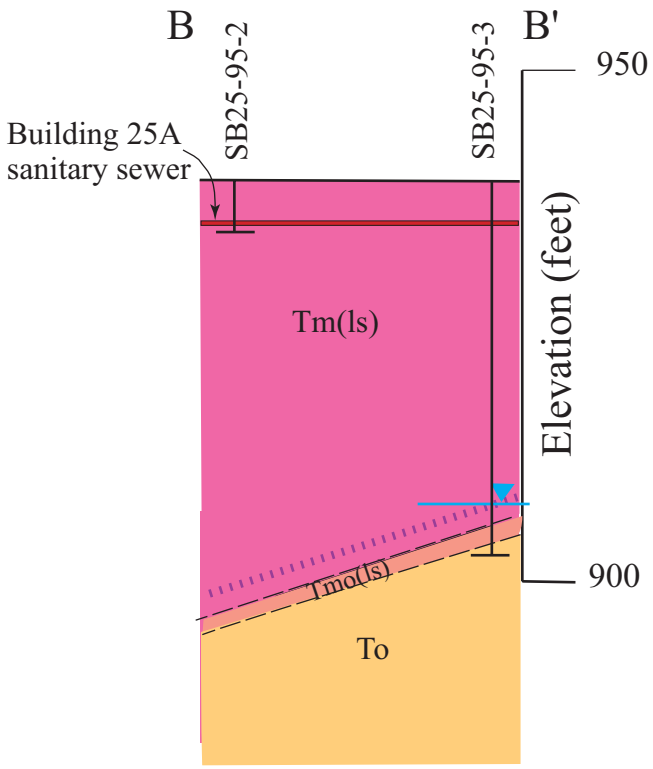

HORIZONTAL SCALE

0 50 100 ft

2x vertical exaggeration

elevation from the
UNIVERSITY OF CALIFORNIA DATUM

Water table surface 3rd quarter FY99

Contact dashed where approximately located

Soil Boring

Tm(ls) Moraga Formation (ls) designates probable landslide deposits

Tmo(ls) Mixed Unit

To Orinda Formation

Figure 7. Geologic Cross Section B B', Building 25A Sanitary Sewer

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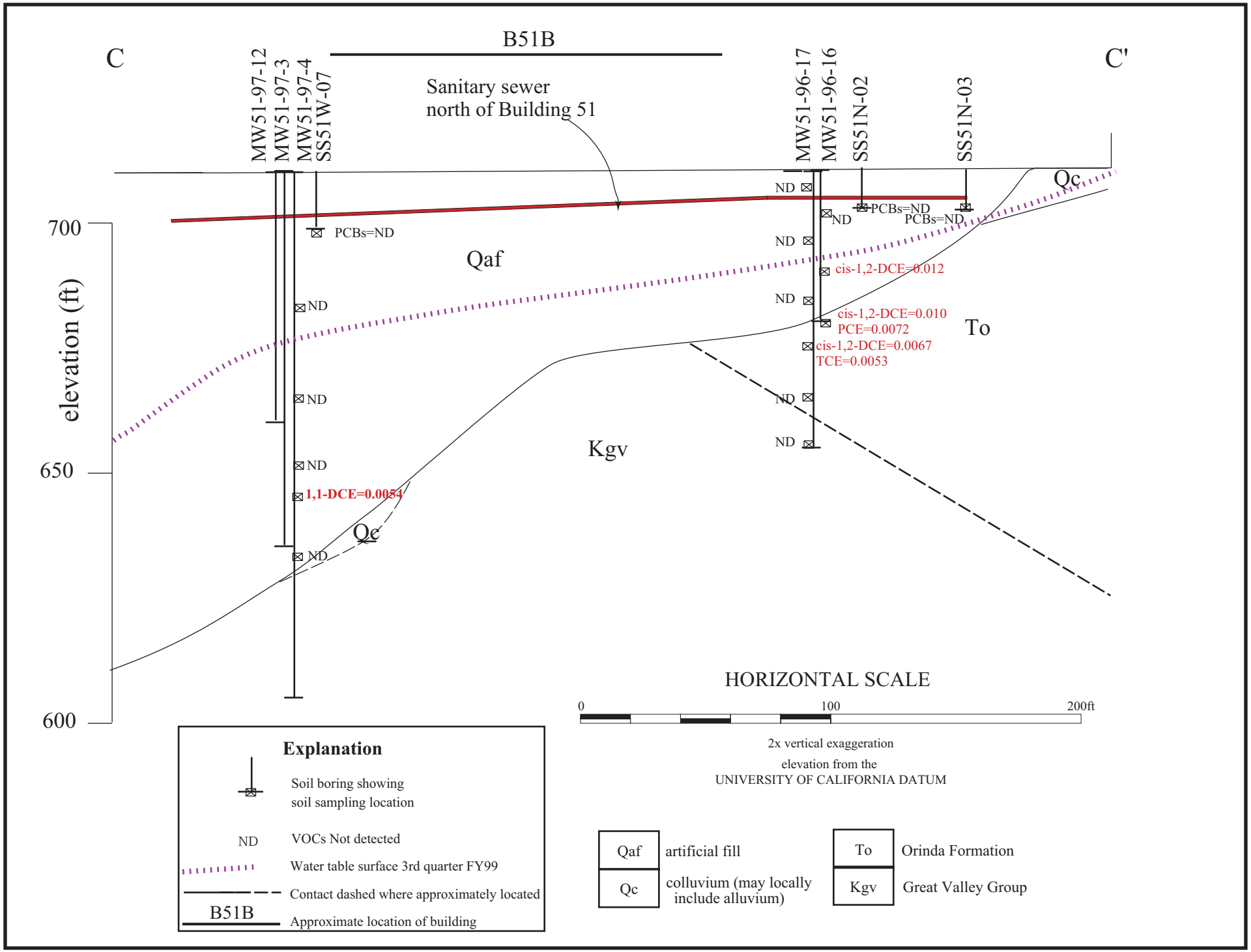

Figure 8. Concentrations of VOCs and PCBs Detected (mg/kg) Sanitary Sewers North and West of Buildings 51 and 51B, Section C C'.

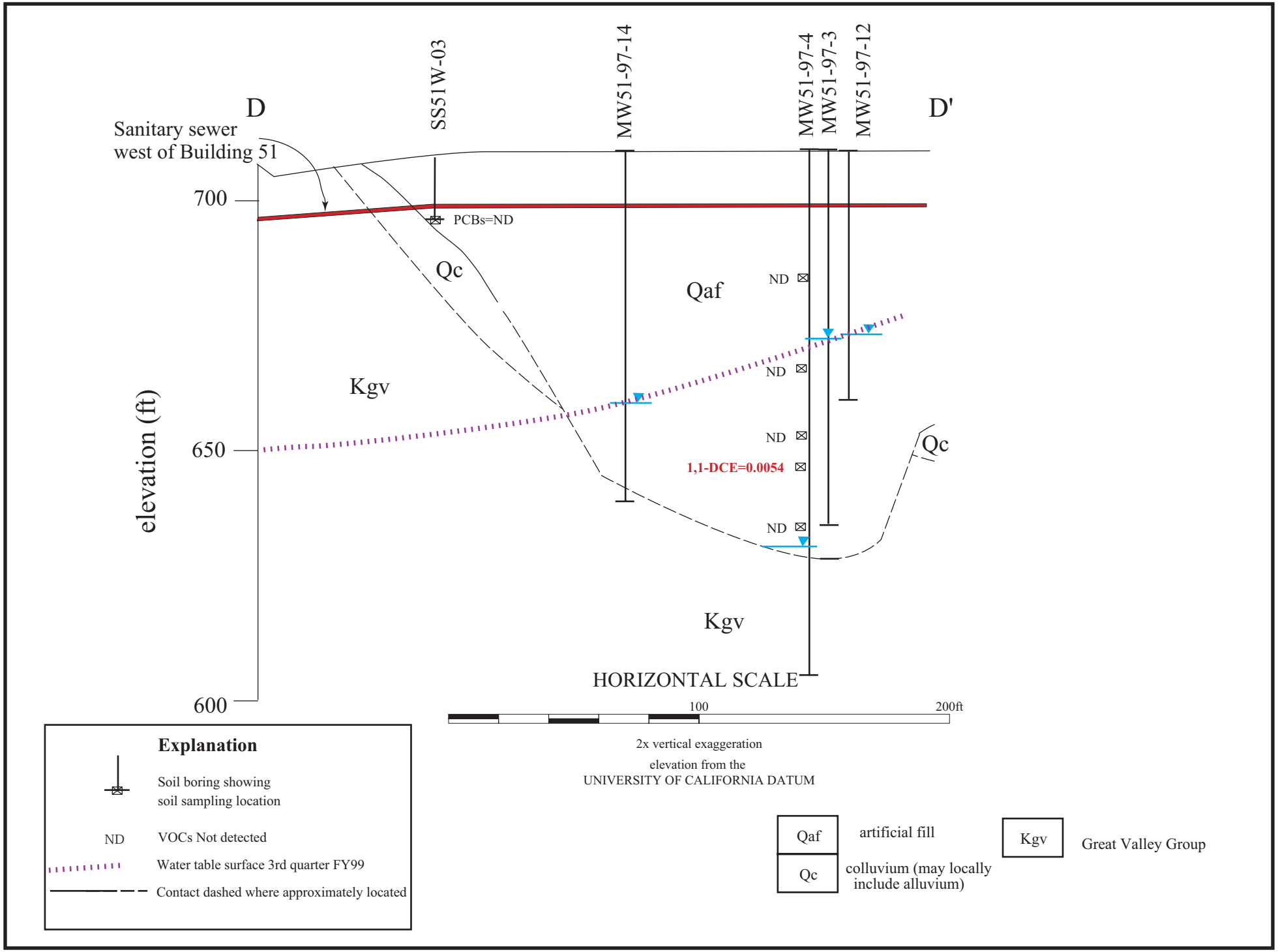

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Figure 9. Concentrations of VOCs and PCBs Detected (mg/kg) Sanitary Sewers North and West of Buildings 51 and 51B, Section DD'.

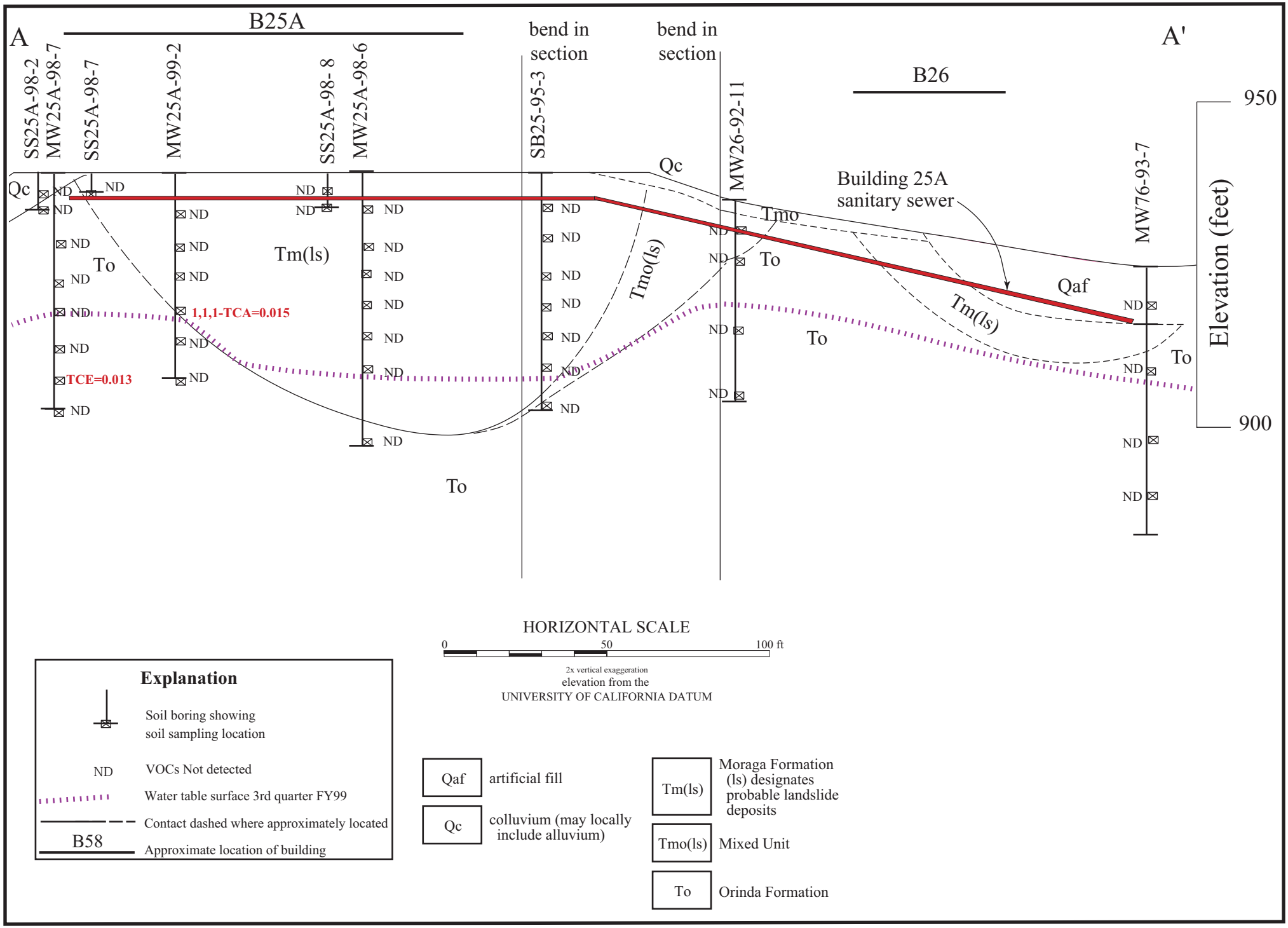

Figure 10. Concentrations of VOCs Detected (mg/kg) Building 25A Sanitary Sewer, Section A A'.

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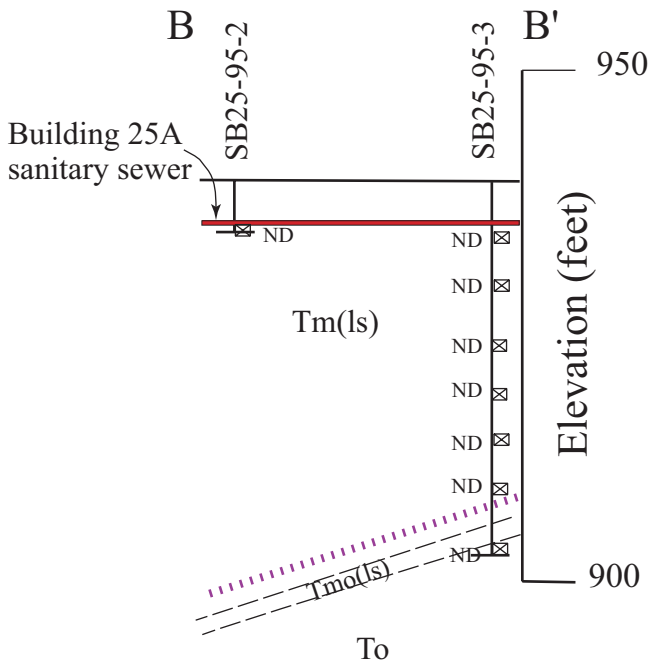

HORIZONTAL SCALE

0 50 100 ft

2x vertical exaggeration

elevation from the
UNIVERSITY OF CALIFORNIA DATUM

Explanation

Soil boring showing soil sampling location

ND — VOCs Not detected

Water table surface 3rd quarter FY99

Contact dashed where approximately located

Tm(ls)	Moraga Formation (ls) designates probable landslide deposits
Tmo(ls)	Mixed Unit
To	Orinda Formation

Figure 11. Concentrations of VOCs Detected (mg/kg) Building 25A Sanitary Sewer, Section B B'.

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Table 1a.
Soil Sampling Results for Organics
AOC 9-8: Sanitary Sewer Lines North and West of Buildings 51 and 51B

				VOCs	PCBs
				8260*	8080
Boring/Sample	Depth (ft)	Date	Lab	mg/kg	mg/kg
SS51W-03-12.7	12.7	Apr-92	C		<0.5
SS51W-07-13	13.0	Apr-92	C		<0.5
SS51N-02-7.7	7.7	Apr-92	C		<0.5
SS51N-03-9	9.0	Apr-92	C		<0.5
MW51-96-16-8	8.0	Sep-96	BC	<0.005	
MW51-96-16-19	19.0			cis-1,2-DCE=0.012	
MW51-96-16-28.5	28.5			cis-1,2-DCE=0.010 PCE=0.0072	
MW51-96-17-3.2	3.2	Sep-96	BC	<0.005	
MW51-96-17-13.5	13.5			<0.005	
MW51-96-17-23.5	23.5			<0.005	
MW51-96-17-33.2	33.2			cis-1,2-DCE=0.0067 TCE=0.0053	
MW51-96-17-43	43.0			<0.005	
MW51-96-17-53	53.0			<0.005	
MW51-97-4-25.4	25.4	May-97	BC	<0.005	
MW51-97-4-45.3	45.3			<0.005	
MW51-97-4-58.7	58.7			<0.005	
MW51-97-4-64.4	64.4			1,1-DCE=0.0054	
MW51-97-4-73.9	73.9			<0.005	
MW51-97-3-COMP (Drum 1)		Jun-97	BC	<0.005	
MW51-97-3-COMP (Drum 2)				<0.005	
MW51-97-3-COMP (Drum 3)				<0.005	
MW51-97-3-COMP (Drum 4)				<0.005	
MW51-97-3-COMP (Drum 5)				<0.005	
MW51-97-3-COMP (Drum 6)				<0.005	
MW51-97-12-COMP(0-20)	0-20	Sep-97	BC	<0.005	
MW51-97-12-COMP(20-35)	20-35			<0.005	
MW51-97-12-COMP(35-40)	35-40			<0.005	
MW51-97-12-COMP(45-50)	45-50			<0.005	
MW51-97-14-0-17Comp	0-17	Sep-97	BC	<0.005	
MW51-97-14-17-32Comp	17-32			<0.005	
MW51-97-14-32-45Comp	32-45			<0.005	
MW51-97-14-45-58Comp	45-58			<0.005	
MW51-97-14-58-70Comp	58-70			<0.005	

BC = Analysis by BC Laboratories
C = Analysis by Chromalab, Inc.

< = Not detected
= Not analyzed

*Detection limit for Methylene Chloride and Total xylene is 0.01
Samples with a "COMP" designation are composite samples.

Table 1b.
Soil Sampling Results for Metals
AOC 9-8: Sanitary Sewer Lines North and West of Buildings 51 and 51B.
(Concentrations in mg/kg)

		Sb	As	Ba	Be	Cd	Cr	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	V	Zn
*Maximum Background Concentrations***		5.5	19.1	323.6	1.0	2.7	99.6	22.2	69.4	16.1	0.4	7.4	119.8	5.6	1.8	27.1	74.3	106.1
USEPA Region 9 PRGs		30	0.38	5200	150	37	210	3300	2800	400	22	370	1500	370	370	6	520	22000
California Modified PRGs						9				130			150					
Boring/Sample	**Date**																	
MW51-96-16-8	Sep-96	*<10*	2.2	129	*<1*	*<1*	105	18	26	10	*<0.2*	*<5*	78	2	*<2*	*<10*	86	51
MW51-96-16-19		*<10*	8	166	*<1*	*<1*	80	14	40	5	*<0.2*	*<5*	100	1.8	*<2*	*<10*	51	68
MW51-96-16-28.5		*<10*	5.6	262	*<1*	*<1*	40	8	25	6.6	*<0.2*	*<5*	43	1.8	*<2*	*<10*	39	64
MW51-96-17-3.2	Sep-96	*<10*	2.3	134	*<1*	*<1*	52	14	29	6.8	*<0.2*	*<5*	79	1.4	*<2*	*<10*	31	84
MW51-96-17-13.5		*<10*	2.2	156	*<1*	*<1*	84	23	27	*<5*	*<0.2*	*<5*	61	1.7	*<2*	*<10*	77	58
MW51-96-17-23.5		*<10*	7.2	132	*<1*	*<1*	100	16	33	*<5*	*<0.2*	*<5*	136	1.3	*<2*	*<10*	54	56
MW51-96-17-33.2		*<10*	4.5	172	*<1*	*<1*	78	15	47	*<5*	*<0.2*	*<5*	87	1.2	*<2*	*<10*	53	69
MW51-96-17-43		*<20*	13	298	*<2*	*<2*	107	17	33	*<10*	*<0.2*	*<10*	129	2.9	*<4*	*<20*	79	93
MW51-96-17-53		*<20*	9.5	319	*<2*	*<2*	116	21	29	10	*<0.2*	*<10*	194	3.2	*<4*	*<20*	64	118
MW51-97-4-COMP(D1)	May-97	*<10*	5.9	122	*<1*	*<1*	56	11	28	*<5*	*<0.2*	*<5*	41	*<1*	*<2*	*<10*	50	57
MW51-97-4-COMP(D2)		*<10*	5.1	130	*<1*	*<1*	59	12	40	*<5*	*<0.2*	*<5*	54	*<1*	*<2*	*<10*	46	60
MW51-97-4-COMP(D3)		*<10*	4.5	183	*<1*	*<1*	56	11	30	*<5*	*<0.2*	*<5*	69	*<1*	*<2*	*<10*	35	63
MW51-97-4-COMP(D4)		*<10*	4.1	183	*<1*	*<1*	51	9.8	55	6.1	*<0.2*	*<5*	64	*<1*	*<2*	*<10*	31	71
MW51-97-3-COMP(D1)	Jun-97	*<20*	3.2	165	*<2*	*<2*	106	20	26	*<10*	*<0.2*	*<10*	91	*<2*	*<4*	*<20*	76	68
MW51-97-3-COMP(D2)		*<20*	2.7	142	*<2*	*<2*	107	22	25	*<10*	*<0.2*	*<10*	84	*<2*	*<4*	*<20*	88	60
MW51-97-3-COMP(D3)		*<20*	3.5	128	*<2*	*<2*	89	16	25	*<10*	*<0.2*	*<10*	73	*<2*	*<4*	*<20*	63	59
MW51-97-3-COMP(D4)		*<10*	3.5	128	*<1*	*<1*	61	11	19	*<5*	*<0.2*	*<5*	44	*<1*	*<2*	*<10*	55	55
MW51-97-3-COMP(D5)		*<20*	7.2	134	*<2*	*<2*	50	*<10*	20	*<10*	*<0.2*	*<10*	42	*<2*	*<4*	*<20*	45	59
MW51-97-3-COMP(D6)		*<10*	5	140	*<1*	*<1*	59	11	20	*<5*	*<0.2*	*<5*	50	*<1*	*<2*	*<10*	53	61
MW51-97-12-COMP(0-20)	Sep-97	*<10*	4.4	139	*<1*	*<1*	76	15	24	5.3	*<0.2*	*<5*	71	*<1*	*<2*	*<10*	61	56
MW51-97-12-COMP(20-35)		*<10*	3.1	144	*<1*	*<1*	90	18	26	7.4	*<0.2*	*<5*	73	*<1*	*<2*	*<10*	77	61
MW51-97-12-COMP(35-40)		*<10*	4.8	131	*<1*	*<1*	102	18	32	*<5*	*<0.2*	*<5*	93	*<1*	*<2*	*<10*	71	63
MW51-97-12-COMP(45-50)		*<10*	5.1	149	*<1*	*<1*	82	15	27	*<5*	*<0.2*	*<5*	55	*<1*	*<2*	*<10*	67	66
MW51-97-14-0-17Comp	Sep-97	*<10*	3.5	135	*<1*	*<1*	85	18	23	*<5*	*<0.2*	*<5*	72	*<1*	*<2*	*<10*	68	53
MW51-97-14-17-32Comp		*<10*	3.5	127	*<1*	*<1*	87	18	36	6.1	*<0.2*	*<5*	72	*<1*	*<2*	*<10*	75	75
MW51-97-14-32-45Comp		*<10*	4.1	131	*<1*	*<1*	82	16	36	5.5	0.21	*<5*	80	*<1*	*<2*	*<10*	60	58
MW51-97-14-45-58Comp		*<10*	7.5	165	*<1*	*<1*	72	12	35	7.1	*<0.2*	*<5*	58	*<1*	*<2*	*<10*	58	66
MW51-97-14-58-70Comp		*<10*	10	178	*<1*	*<1*	58	15	57	11	*<0.2*	*<5*	52	*<1*	*<2*	*<10*	53	108

NA	= Not analyzed
<5	= Not detected (reporting limit shown)
25	= Concentration above background but below PRG.
194	= Concentration above both background and PRG.

Table 2a.

Soil Sampling Results for Organics, Fuels, and pH

AOC 10-3: Building 25A Sanitary Sewer System

				VOCs			Fuels	TPH-D	TPH-G	Oil & Grease	pH
				8010/8020*	8240**	8260***	8015M#	8015M	8015M	413.1	9040
Boring/Sample	Depth (ft)	Date	Lab	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	S.U.
MW26-92-11-4	4.0	Mar-92	Q	<0.005							
MW26-92-11-9	9.0			<0.005							
MW26-92-11-20.5	20.5			<0.005							
MW26-92-11-30.2	30.2			<0.005							
MW76-93-7-5.5	5.5	Aug-93	C		<0.005			<1	<1	<50	
MW76-93-7-15.5	15.5				<0.005			<1	<1	<50	
MW76-93-7-26	26.0				<0.005			<1	<1	<50	
MW76-93-7-35.5	35.5				<0.005			<1	<1	<50	
SB25-95-2-3.7	3.7	Apr-95	BC			<0.005	<10				7.68
SB25-95-3-5.3	5.3	Apr-95	BC			<0.005	<10				8.37
SB25-95-3-10	10.0					<0.005	<10				8.22
SB25-95-3-15.7	15.7					<0.005	<10				8.45
SB25-95-3-20.6	20.6					<0.005	<10				8.31
SB25-95-3-25	25.0					<0.005	<10				8.43
SB25-95-3-30	30.0					<0.005	<10				8.33
SB25-95-3-35.5	35.5					<0.005	<10				9.02
SS25A-98-1-2	2.0	Jun-98	BC			<0.005					
SS25A-98-1-4.1	4.1					<0.005					
SS25A-98-2-2	2.0	Jun-98	BC			<0.005					
SS25A-98-2-4	4.0					<0.005					
SS25A-98-3-1.9	1.9	Jun-98	BC			<0.005					
SS25A-98-3-4	4.0					<0.005					
SS25A-98-4-1.8	1.8	Jun-98	BC			<0.005					
SS25A-98-4-4.2	4.2					<0.005					
SS25A-98-5-1.8	1.8	Jun-98	BC			<0.005					
SS25A-98-5-4	4.0					<0.005					
SS25A-98-6-2	2.0	Jun-98	BC			<0.005					
SS25A-98-6-4.2	4.2					<0.005					
SS25A-98-7-2	2.0	Jun-98	BC			<0.005					
SS25A-98-8-2	2.0	Jun-98	BC			<0.005					
SS25A-98-8-4.2	4.2					<0.005					

Table 2a (Continued)

Soil Sampling Results for Organics, Fuels, and pH

AOC 10-3: Building 25A Sanitary Sewer System

				VOCs			Fuels	TPH-D	TPH-G	Oil & Grease	pH
				8010/8020*	8240**	8260***	8015M	8015M	8015M	413.1	9040
Boring/Sample	Depth (ft)	Date	Lab	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	S.U.
MW25A-98-7-10.6	10.6	Aug-98	BC			<0.005					
MW25A-98-7-15.6	15.6					<0.005					
MW25A-98-7-20.3	20.3					<0.005					
MW25A-98-7-25.7	25.7					<0.005					
MW25A-98-7-30.6	30.6					TCE=0.013					
MW25A-98-7-35.9	35.9					<0.005					
SB25A-98-2-3	3.0	Aug-98	BC			<0.005					
SB25A-98-2-3.5	3.5					<0.005					
SB25A-98-2-5.6	5.6					<0.005					
MW25A-98-6-5.0	5.0	Oct-98	BC			<0.005					
MW25A-98-6-11	11.0					<0.005					
MW25A-98-6-15	15.0					<0.005					
MW25A-98-6-20	20.0					<0.005					
MW25A-98-6-25	25.0					<0.005					
MW25A-98-6-30	30.0					<0.005					
MW25A-98-6-41.3	41.3					<0.005					
MW25A-99-2-6	6.0	Apr-99	BC			<0.005					
MW25A-99-2-11	11.0					<0.005					
MW25A-99-2-15.3	15.3					<0.005					
MW25A-99-2-21	21.0					1,1,1-TCA=0.015					
MW25A-99-2-26	26.0					<0.005					
MW25A-99-2-31	31.0					<0.005					

< = Not detected
= Not analyzed

BC = Analysis by BC Laboratories
C = Analysis by Chromalab
Q = Analysis by Quanteq Laboratories

*Detection limit for Total xylenes by method 8020 is 0.02
**Detection limit for Acetone by method 8240 is 0.1
***Detection limit for Methylene Chloride and Total xylene by method 8260 is 0.01
#Detection limit for Light naptha, aviation fuel, gasoline, crude/waste oil, and hydraulic oil by method 8015m is 50
Fuels include: Light Naptha, Aviation Fuel, Stoddard/White Spirits, Heavy Naptha/Ligroin/Petroleum Benzine, Gasoline, JP4, JP5, JP6, JP8, Kerosene/Jet Fuel, Diesel, Crude/Waste Oil, Hydraulic Oil, and WD-40

Table 2b.
Soil Sampling Results for Metals
AOC 10-3: Building 25A Sanitary Sewer System
(Concentrations in mg/kg)

		Sb	As	Ba	Be	Cd	Cr	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	V	Zn
*Maximum Background Concentrations***		5.5	19.1	323.6	1.0	2.7	99.6	22.2	69.4	16.1	0.4	7.4	119.8	5.6	1.8	27.1	74.3	106.1
USEPA Region 9 PRGs		30	0.38	5200	150	37	210	3300	2800	400	22	370	1500	370	370	6	520	22000
California Modified PRGs						9				130			150					
Boring/Sample	**Date**																	
MW26-92-11-4	Mar-92	<2	11	91	0.8	0.3	67	17	15	9	<0.2	<0.6	54	<2	5.2	<3	64	56
MW26-92-11-9		<2	7	170	0.8	0.2	59	19	20	6	<0.2	<0.6	40	<2	<0.2	<3	60	36
MW26-92-11-20.5		<2	10	100	0.5	0.2	100	20	32	7	<0.2	<0.6	190	<2	<0.2	4	50	53
MW26-92-11-30.2		<2	11	94	0.6	<0.2	77	16	35	8	<0.2	<0.6	130	2	<0.2	8	50	57
MW76-93-7-5.5	Aug-93	3.0	<0.25	30	0.10	2.1	49	15	34	<0.5	0.06	3.2	130	<0.5	1.0	<2	21	26
MW76-93-7-15.5		<1	<0.25	54	0.28	6.0	38	8.8	42	<0.5	0.06	3.7	130	<0.5	1.1	<2	42	58
MW76-93-7-26		<1	5.0	120	0.29	4.0	43	16	58	5.4	0.12	3.3	91	<0.5	2.0	<2	49	66
MW76-93-7-35.5		3.1	13	180	0.36	2.9	34	13	25	<0.5	<0.05	5.7	68	<0.5	1.8	<2	20	43
SB25-95-2-3.7	Apr-95	<5	<1	114	<0.5	<0.5	34	13	10	<2.5	<0.2	<2.5	12	<0.5	<1	<5	51	52
SB25-95-3-5.3	Apr-95	<5	<0.5	59	<0.5	<0.5	18	24	19	<2.5	<0.2	<2.5	40	<0.5	<1	<5	23	61
SB25-95-3-10		<5	<0.5	47	<0.5	<0.5	34	15	18	<2.5	<0.2	<2.5	19	<0.5	<1	<5	35	54
SB25-95-3-15.7		<5	<0.5	62	<0.5	<0.5	19	14	22	<2.5	<0.2	<2.5	12	<0.5	<1	<5	26	56
SB25-95-3-20.6		<5	<0.5	92	<0.5	<0.5	31	23	26	<2.5	<0.2	<2.5	28	<0.5	<1	<5	43	60
SB25-95-3-25		<5	<1	81	<0.5	<0.5	32	20	29	<2.5	<0.2	<2.5	25	<0.5	<1	<5	61	60
SB25-95-3-30		<5	1.5	204	<0.5	<0.5	108	21	14	<2.5	<0.2	<2.5	52	<0.5	<1	<5	63	55
SB25-95-3-35.5		<5	1.4	130	<0.5	<0.5	74	16	43	3.3	<0.2	<2.5	61	<0.5	<1	<5	61	69
MW25A-98-7Comp	Aug-98	<20	4.0	147	<2	<2	100	18	35	<10	<0.2	<10	165	<2	<4	<20	63	67
SB25A-98-2Comp	Aug-98	<20	6.4	117	<2	<2	85	20	39	11	<0.2	<10	139	<2	<4	<20	68	70
MW25A-98-6Comp	Oct-98	<10	1.5	104	<1	<1	87	14	22	60	<0.2	<5	62	<1	<2	<10	66	45

RFA = Sample was collected during the RCRA Facility Assessment

NA	= Not analyzed
<5	= Not detected (reporting limit shown)
100	= Concentration above background but below PRG.
190	= Concentration above both background and PRG.

Attachment 1

LBNL Response to the April 30, 1999 DTSC Notice of Deficiency, dated May 28, 1999

LBNL RESPONSE TO DTSC COMMENTS
(Notice of Deficiency for NFA or NFI Status Request for SWMUs 3-6 and 9-6 and AOCs 8-7, 9-8, and 10-3, Lawrence Berkeley National Laboratory, Berkeley, CA. EPA ID No. CA 4890 008 986. Dated April 30, 1999)

The following are Lawrence Berkeley National Laboratory (LBNL) Environmental Restoration Program (ERP) responses to comments received from the Department of Toxic Substances Control (DTSC), in a letter dated April 30, 1999 from Salvatore Ciriello to Iraj Javandel of LBNL. Each of the DTSC's comments is given, followed by the LBNL response in boxed text.

For AOC 9-8, Sanitary Sewer Lines BLDG.'s 51 and 51B

5. Characterize the full extent of the contamination associated with this unit, clearly identifying any migration of contaminants to ground and surface waters.

LBNL Response

Refer to the first general comment about the definition of "contamination" associated with this unit.

The statement "the contamination associated with this unit" presumes that there is contamination resulting from leaks in the sanitary sewer lines. Based on the results of surveys of the sewer lines, concentrations of contaminants detected, depths relative to the water table where the samples were collected, and contaminants detected in groundwater, the groundwater is the source of the contamination detected in the soil.

The LBNL RFA discusses surveys of the LBNL sanitary sewer system that were conducted in 1977 and 1991 to identify areas of corrosion or breakage. No corroded or damaged segments were identified along the Building 51 sanitary sewers by the surveys. Groundwater contamination by halogenated hydrocarbons has been identified in the area underlying AOC 9-8. A source area for the contamination has been determined. Given the sewer survey results and the RFI soil sampling results, the trace concentrations (0.055 mg/kg maximum concentration) of chlorinated hydrocarbons detected in soil samples collected near the sewer lines are believed to be associated with the groundwater contamination. Five of the soil samples that contained halogenated hydrocarbons were collected below the water table. At three locations where halogenated hydrocarbons were detected below the water table, no contamination was detected in samples collected above the water table but below the elevation of the sewer lines. As reported in the LBNL RFA report, PCBs, a known constituent in past effluent from Building 51, were not detected in soil samples collected along the sanitary sewer lines.

There is no known direct migration pathway from the Building 51 sanitary sewer lines to surface water. Surface water and sediment samples have been collected from site creeks (including North Fork Strawberry Creek downgradient from the unit) and analyzed for chemicals of

potential concern. As reported in the quarterly progress reports, no PCBs were detected in sediment samples from North Fork Strawberry Creek.

Proposed Work

LBNL will use a two-phase approach to further determine whether the Building 51 and 51B sanitary sewer lines released waste. First, LBNL will conduct a survey of the Building 51 and 51B sanitary sewer lines to identify any dislocations, breaks, or perforations caused by corrosion. If dislocations, breaks, or perforations are identified, a work plan will be prepared and submitted to DTSC for additional sampling. If no dislocations, breaks, or perforations are identified, AOC 9-8 will be resubmitted for NFI status.

6. Provide drawings with dimensions showing horizontal location and depth of samples collected.

LBNL Response

Scale drawings showing the locations (horizontal and vertical) of samples with respect to the pipe will be provided in a future work plan and/or a revised NFA/NFI request report.

7. Preliminary Remediation Goals (PRG's) cannot be used as detection limits in these investigations. The presence of halogenated compounds above background should actually be an indication that further investigation might be needed in order to clearly ascertain the origin of the contaminants and to discard or identify the presence of any existing hot spots. Once sufficient sampling under a statistically representative plan is conducted, then PRG's can be used as a threshold as agreed.

LBNL Response

LBNL does not use Preliminary Remediation Goals (PRGs) as detection limits or to define the extent of contamination. As approved by the DTSC, LBNL uses USEPA Region IX PRGs for residential soil (USEPA, 1998) as the approved action levels (ALs) to determine if further action may be required. PRGs are a presumptive contaminant concentration in soil above which inclusion of the unit in the Corrective Measures Study (CMS) may be required.

Based on the results of surveys of the sewer lines, concentrations of contaminants detected, depths relative to the water table where the samples were collected, and contaminants detected in groundwater, the groundwater is the source of the contamination detected in the soil. All detections of halogenated hydrocarbons in soil samples were at locations where the groundwater is contaminated with halogenated hydrocarbons. Five of the soil samples where halogenated hydrocarbons were detected were collected below the water table. The other four soil samples where halogenated hydrocarbons were detected were collected within 10 feet above the water table. The presence of halogenated compounds at trace levels (0.055 mg/kg maximum concentration) does not mean that further investigation will be beneficial in "clearly ascertaining" the origin of contamination and identifying the presence of any hot spots,

particularly when a more probable source of the contamination (contaminated groundwater) is present.

The concept of "sufficient sampling under a statistically representative plan" needs to be clarified.

8. The statement suggesting that results of the soil gas sampling conducted may be partitioning from ground water is not sufficient to justify dismissal of the data or to reduce the scope of the investigation.

LBNL Response

The soil-gas sampling results were not used to "reduce the scope of the investigation" nor were the results dismissed. The soil-gas sampling was conducted during the RFA as an initial site-screening tool.

For AOC 10-3 BLDG. 25A Sanitary Sewer

9. Provide drawings with dimensions showing horizontal locations and depths of samples to evaluate results appropriately.

LBNL Response

Scale drawings showing the locations (horizontal and vertical) of samples with respect to the pipe will be provided in a future work plan and/or a revised NFA/NFI request report.

10. Explain clearly the strategy pursued to identify releases or to discard with certainty the possibility of such releases.

LBNL Response

The strategy that LBNL used "to identify releases or to discard with certainty the possibility of such releases" was to survey the sewer lines for perforations or breaks and to collect and analyze environmental samples along the sewer lines. The LBNL RFA discusses surveys of the LBNL sanitary sewer system in 1977 and 1991. One corroded segment and one possible dislocated segment were identified in the sanitary sewer line east of Buildings 25A and Building 26.

During the LBNL RFA, soil-gas samples were collected at 25 locations along the sanitary sewers emanating from Buildings 25A and 26 as an initial screening of the sanitary sewer lines. In addition, a shallow soil sample was collected during the RFA at the possible dislocation in the sewer line identified in the 1991 survey. A groundwater monitoring well was installed at the location where the maximum concentration of PCE was detected in the soil-gas samples (soil samples were collected from the boring for the monitoring well for further characterization).

During the RFI, additional soil samples were collected along the sanitary sewer lines from three soil borings located at bends and junctures of the sewer lines. Bends and junctures are likely stress points in sewer lines, where dislocations are more likely to occur. Also, several soil and soil-gas samples were collected at floor drains along the sub-floor waste line system of Building 25A that drains to the sanitary sewer system east of Building 25A. Floor drain connections are also stress points in the sewer line where breaks caused by dislocations are more likely to occur. The results of this sampling are discussed in the LBNL NFA/NFI request report.

Proposed Work

LBNL will use a two-phase approach to supplement the previous characterization work to determine whether the Building 25A and 26 sanitary sewer lines discharged wastes. First, LBNL will re-survey the Building 25A and 26 sanitary sewer lines to identify any dislocations or corroded sections. If dislocations, breaks, or perforations are identified by the survey, a work plan for additional sampling will be prepared and submitted to DTSC. If no dislocations, breaks, or perforations are identified, AOC 10-3 will be resubmitted for NFA status.

11. Clarify the kind of waste that is suspect to have been released by this unit. According to the DTSC's RFA, this unit was also suspect of releasing plating wastes containing cyanides and metals.

The types of waste handles by AOC 10-3 are provided in the NFA/NFI request report. The portion of the above comment, "…this unit was also suspect of releasing plating wastes containing cyanides and metals," refers to a different AOC than the one in question. The DTSC RFA suspected releases of plating wastes from operations of the plating shop in Building 25 to the sanitary sewer. The Building 25 sanitary sewer is DTSC's AOC-5, which is LBNL's AOC 10-4. The locations of the Building 25 sanitary sewer and the Building 25A sanitary sewer are shown on Figure 6a of the LBNL NFA/NFI request report.

12. The statement that results of soil-gas sampling conducted may be partitioning from ground water is not sufficient to justify dismissal of the data or to reduce the scope of the investigation for this particular unit.

The soil-gas sampling results were not used to "reduce the scope of the investigation" nor were the results dismissed. The soil-gas sampling was conducted as an initial site-screening tool.

Attachment 2

Memorandums from LBNL Facilities Department to Iraj Javandel,
Environmental Restoration Program Manager,
dated October 29, 1999

FACILITIES DEPARTMENT

MEMORANDUM October 29, 1999

To: Iraj Javandel

From: Joseph Walling and Bob Torres

Subject: Inspection of Sanitary Sewer lines east of Building 25A

As per your request, on October 14, 1999, we surveyed the sanitary sewer lines, east of Building 25A and north of Building 26, using a R.S. Technical Services Inc. 1200-series camera. As shown on the attached map, the sewer system at this location consists of two branches, one coming out of Building 25A and another one out of the restrooms and Boiler Room #2. The length of the first one is about 28ft. and the second one is approximately 38 ft. long. After joining together, the line will continue from clean out (C.O.) #3 to the Manhole #SMH2N33E which is about 137 ft. long. No defects, root intrusion or displacement was observed along any one of these three lines. All of our observations were recorded on a video tape that has been submitted to you for your record. Please contact Joseph Walling, Berkeley Lab Utility Coordinator, at 486-4842 for additional information if needed.

cc: Jackie Thomas

FACILITIES DEPARTMENT

MEMORANDUM October 29, 1999

To: Iraj Javandel

From: Joseph Walling and Bob Torres Robert Torres Joseph Walling

Subject: Inspection of Sanitary Sewer lines north and west of Building 51

As per your request, on October 26, 1999, we surveyed the sanitary sewer lines, north of Building 51 between Man holes # SMH11N21E and SMH11N18E and west of the building between Manholes # SMH11N18E and SMH10N18E, using an R. S. Technical Services Inc. 1200-series camera. As shown on the attached map, the effluent from the Building 51 basement sump pump has been flowing to the Manhole # SMH11N21E. From Manhole # SMH11N21E to the edge of Building 51B the line consists of 6-inch cast iron pipe with about 5 ft. cover. From there, the depth of the pipe increases to 8 ft. and at SMH11N18E the depth to the sewer line is about 10 ft. The total length of the pipes surveyed was about 440 ft. No defects, root intrusion or displacement was observed within any section of the lines inspected. All of our observations were recorded on a video tape that has been submitted to you for your record. Please contact Joseph Walling, Berkeley Lab Utility Coordinator, at 486-4842 for additional information if needed.

cc: Jackie Thomas